



NEXT MEETING

Sunday 12th February

Belviour Guides Hall

6 Silva Drive West Wodonga

Meetings start with a 12.00pm BBQ lunch

Call in Via VK3RWO, 146.975, 123 Hz



*"CQ, CQ, CQ, CQ, CQ, CQ 20 meters;
CQ, CQ, CQ, CQ 20; CQ, CQ, CQ, CQ, CQ 20 meters;
CQ, CQ, CQ, CQ 20; CQ 20; CQ 20 meters ... "*

It's not just hipsters using tapes and floppy disks

Batteries that come from trees

7NT Site Sale

NEVARC Nets

NEVARC Club Profile

2

4

7

13

14

It's not just hipsters using tapes and floppy disks

Sony recently announced it would stop making Betamax tapes.

Many were surprised the format was still used in Japan – but it's far from the only retro tech clinging on.

We live in forward-looking times. From the latest smartphones to ultra high-definition screens, it often feels like gadgets are doomed to be replaced within a couple of years – or even months.

That's why the announcement that Sony would stop making Betamax tapes – last popular in the late 1970s – sounded to many as though it had come decades too late.

Who still used Betamax? As everyone knows, the format was widely trounced in competition by the VHS format during the 1980s, despite arguably being a better format. But to much of the world's surprise, it turned out that Betamax is still on sale in Japan today, although not for much longer.

What other technologies are still hanging on despite the rise of newer alternatives?

Floppy disks

Many will have fond memories of floppy disks – which were by far the most popular way of transferring data between computers before the age of CDs, USB drives and, of course, the web.

Floppy disks are, in fact, still in regular, official use in Norway today. In September, Finn Gundersen, a software developer working in the country, posted a blog in which he explained that Norwegian doctors receive a floppy disk from the government every month. The disk carries the latest version of Norway's patient-doctor list – a system in which every registered patient chooses a specific doctor as their “go to” physician. Because patients can change their choice of preferred doctor at any time, the list needs to be updated and distributed constantly.

“The floppy disks are inexpensive; they cost far less than a USB drive and are far less time-consuming to write to than a CD-ROM for this amount of data”, wrote Gundersen. “Given the historical restriction of delivery by mail, and the data volume being less than 1.44MB, they are the logical choice.”

Fax machines

The rise of email and document scanners has, for many, sounded the death knell for the once ubiquitous fax machine. But the technology – which was invented way back in 1842 – is still relatively common in Japan, where it was popularised in the 1970s.

Thanks to the importance of handwriting in Japan (there are thousands of characters in Japanese alphabets), the fax machine has often been seen as a convenient way to send formal, personal notes between individuals.

Legal documents and certificates can also be faxed, of course, and some companies require that they be transferred this way in order to help guarantee their authenticity.

Feature phones

Worldwide smartphone sales have surpassed those of feature phones (handsets with more limited functionality compared to, say, iOS or Android devices) for a few years now. In sub-Saharan Africa, though, the feature phone remains king.

A study published by Pew Research earlier this year found that smartphones are yet to become popular in seven countries on the continent. This is partly due to the cost of smartphones and also the popularity of banking

services like M-Pesa in Kenya and Tanzania which only needs SMS functionality for certain operations – such as transferring money between individuals.

In sub-Saharan Africa the feature phone remains king.

Generally, sending text messages is the most popular activity on cell phones in the seven countries surveyed by Pew. The importance of accessing social networks or performing more complex online queries like applying for a job, for example, is much lower.

Pneumatic tubes

Pneumatic tubes, into which a container with a document may be popped to be whisked away by a rapid flow of air, were invented in the early 1800s. And yet, they remain indispensable to a large number of hospitals worldwide. The hospital at University College London is just one example.

The reason is that the tubes can transport not only documents but also packets of drugs or patient samples from one part of the building to another very quickly: a pneumatic tube message typically travels at 7.5m per second.

Air is either sucked or blown – depending on the desired direction of travel – through a tube, carrying the container with it. These days, computers are usually responsible for managing the pumps which control this air flow, making sure messages arrive at the intended destination.

Windows XP

On April 8, 2014, Microsoft ended technical support for its hugely popular operating system Windows XP. This meant the software would no longer be updated for regular users, regardless of security problems that might be discovered with it in the future.

The cost of upgrading to alternatives remains prohibitive for many computer users, however, who continue to run the operating system on their machines. Last year, a survey by security firm Kaspersky suggested nearly 40% of Vietnamese users still ran XP with sizeable numbers also present in China, India, Algeria and several other countries.

Among the institutions still relying on XP is the US Navy – although it is paying Microsoft billions of dollars for the privilege of continuing to receive security updates for the software.

Typewriters

The birthplace of typing was not the computer keyboard, but the typewriter. And even though typewriters have been around for well over 100 years, there are some surprising places where they are still in use.

Take the New York Police Department, for example. As recently as February, a US congressman was hoping to pass a bill to ban the devices in police stations – where they are still, it seems, frequently used for typing up reports.

What's more, funeral directors in certain US states are required to type up death certificates by typewriter, according to the Wall Street Journal. There's even a company, New Jersey-based Swintec, devoted to producing the machines.

Don't believe all the hype, then, about the latest gadgets. Even though some technologies seem to be outmoded and obsolete, there is very likely someone, somewhere, who still does things the old-fashioned way.

~Internet

Batteries that come from trees

As demand for electric vehicles soars, scientists are searching for materials to make sustainable batteries. Lignin, the stuff that makes trees woody, is shaping up to be a strong contender.

About eight years ago, a major paper producer in Finland realised the world was changing. The rise of digital media, a fall in office printing and the dwindling popularity of sending things by post – among other factors – meant that paper had embarked on a steady decline.

Stora Enso, in Finland, describes itself as "one of the largest private forest owners in the world". As such, it has a lot of trees, which it uses to make wood products, paper and packaging, for example. Now it wants to make batteries as well – electric vehicle batteries that charge up in as little as eight minutes.

The company hired engineers to look into the possibility of using lignin, a polymer found in trees. Around 30% of a tree is lignin, depending on the species – the rest is largely cellulose.

"Lignin is the glue in the trees that kind of glues the cellulose fibres together and also makes the trees very stiff," explains Lauri Lehtonen, head of Stora Enso's lignin-based battery solution, Lignode.

Lignin, a polymer, contains carbon. And carbon makes a great material for a vital component in batteries called the anode. The lithium ion battery in your phone almost certainly has a graphite anode – graphite is a form of carbon with a layered structure.

Stora Enso's engineers decided that they could extract lignin from the waste pulp already being produced at some of their facilities and process that lignin to make a carbon material for battery anodes. The firm is partnering with Swedish company Northvolt and plans to manufacture batteries as early as 2025.

With more and more people buying electric cars and storing energy at home, the global appetite for batteries is expected to grow sharply in the coming years. As Lehtonen sees it, "the demand is just mind-blowing".

In 2015, a few hundred additional gigawatt hours (GWh) were required every year across the world's battery stocks – but this will rocket to few thousand additional GWh required annually by 2030 as the world moves away from fossil fuels, according to management consultancy McKinsey. The problem is that the lithium ion batteries we rely on today largely depend on environmentally damaging industrial processes and mining. Plus, some of the materials for these batteries are toxic and difficult to recycle. Many are also sourced in countries with poor human rights records.

Making synthetic graphite, for example, involves heating carbon to temperatures of up to 3,000C (5,432F) for weeks at a time. The energy for this often comes from coal-fired power plants in China, according to consultancy Wood Mackenzie.

The search is on for sustainable battery materials that are more widely available. Some say we can find them in trees.

Generally, all batteries need a cathode and anode – the positive and negative electrodes, respectively, between which charged particles called ions flow. When a battery is charged, lithium or sodium ions, for example, transfer from the cathode to the anode, where they settle like cars in a multi-storey car park, explains Jill Pestana, a California-based battery scientist and engineer currently working as an independent consultant.

"The main property that you want in this parking structure of a material is that it can easily take in the lithium or sodium and let it leave, and it doesn't crumble apart," she explains.

When the battery is discharged in order to power something like an electric car, the ions move back to the cathode after releasing electrons – the electrons move through the wire in an electrical circuit, transferring energy to the vehicle.

Graphite, Pestana says, is a "spectacular" material because it works so well as a reliable anode that enables such reactions to take place. Alternatives including lignin-derived carbon structures have a fight on their hands to demonstrate that they are up to the job.

There are multiple firms exploring lignin's potential in battery development, however, such as Bright Day Graphene in Sweden, which makes graphene – another form of carbon – from lignin.

Lehtonen extols the virtues of his firm's carbon anode material, which Stora Enso has named Lignode. He won't reveal exactly how the company turns lignin into a hard carbon structure, or what that structure is, exactly, except to say that the process involves heating the lignin – but to temperatures nowhere near as high as those required for synthetic graphite production.

One important feature of the resulting carbon structure is that it is "amorphous", or irregular, says Lehtonen: "It actually allows a lot more mobility of the ions in and out."

Stora Enso claims that this will help them make a lithium ion or sodium ion battery that can be charged in as little as eight minutes. Fast charging is a key goal for developers of electric vehicle batteries.

Separate research into lignin-derived carbon anodes, by Magda Titirici at Imperial College London in the UK and colleagues, suggests that it is possible to make conductive mats containing intricate, irregular carbon structures with lots of oxygen-rich defects. These defects appear to heighten the anode's reactivity with ions transferred from the cathode in sodium ion batteries, says Titirici, which in turn shortens charging times: "This conductive mat is fantastic for batteries."

Wyatt Tenhaeff, at the University of Rochester in New York State, has also made lignin-derived anodes in laboratory settings. Lignin is "really cool", he says, because it is a byproduct that could have many potential uses. In experiments, he and his colleagues found that they could use the lignin to make an anode with a self-supporting structure, which didn't require glue or a copper-based current collector – a common component in lithium ion batteries. Despite the fact that this could reduce the cost of lignin-derived carbon anodes, he is sceptical that they can compete commercially with graphite anodes.

"I just don't think it's going to be a big enough step-change in terms of cost or performance to replace the entrenched graphite," he says.

There's also the issue of sustainability. Chelsea Baldino, a researcher at the International Council on Clean Transportation, says that so long as the lignin used for anode production is extracted as a byproduct from the paper-making process, then additional trees won't be chopped down in order to make batteries.

A spokesman for Stora Enso confirms that, currently, all lignin the company uses is "a side stream of the pulping process", and utilising it does not increase the number of trees felled or volume of wood used in pulp-making.

Anyone seeking to make anodes from lignin must ensure that the forestry from which that lignin is sourced is also sustainable, however, adds Pestana. "If the pulp industry isn't sustainable, then the material itself isn't a sustainably derived material," she explains.

According to Stora Enso's 2021 annual report, the company "knows the origin of all the wood it uses and 100% comes from sustainable sources".



The sustainability of batteries made from waste paper pulp depends on many factors, including ensuring that the raw materials genuinely come from waste

There is at least one other way that lignin could be used in batteries, besides anodes. In April, a research team in Italy published a paper about their efforts to develop a lignin-based electrolyte. This is the component that sits between the cathode and anode – it helps ions flow between the electrodes but also forces electrons to take the desired path through the electrical circuit to which the battery is connected. In other words, it prevents the electrons from simply bouncing between the electrodes, which would leave your smartphone as dead as a doornail.

You can get polymers for electrolytes from oil, says Gianmarco Griffini at the Polytechnic University of Milan, but he adds that it would be beneficial to find alternative, sustainable sources instead.

He explains that the idea of using lignin arose after he and colleagues experimented with using the material in solar panels – with slightly underwhelming results. "The efficiencies you get in solar cells are relatively limited because lignin is brown, so it actually absorbs some light," he explains. In batteries, that doesn't matter.

For anode production, lignin is heat-treated to break it into its constituent carbons. But Griffini, a self-described "polymer guy", says he prefers to use it in its polymer form. With this in mind, he and colleagues developed a gel polymer electrolyte that aided the movement of ions in an experimental potassium battery. "It actually came out pretty nicely," he says.

The commercial viability of all these ideas is yet to be proven. Titirici adds however that, in theory, you could make a battery that uses polymers from lignin in the electrolyte as well as lignin-derived carbons in the anode.

~Internet

7NT Site Sale

Some techo smut to titillate the jaded devotees of 160m AM.

Broadcast Australia sells it's surplus real estate cheaply if there's little prospect of residential development in the immediate future.

They won't sell Sydenham cheaply though - BAI & the local council are foaming at the mouth at the prospect of offloading that site with 3RN to go to a 10 kW MF outlet and 3LO to go to an FM outlet with a LAP that better suits "Melbourne".

43 acres of choice land at Kelso, near Launceston, went for \$281,000 in 2018, complete with a solid brick shack, garage with EPP, two 500 ft MF radiators tuned to 702 kHz and just a bit of copper wire underground, about 12 km of 100 lb tinned copper.

7NT originally was 7 kW & OD then a second mast was added to give a figure 8 pattern with an east-west major axis and a 10 kW tx.

The first back-up program source was 3LO off-air via a Beverage aerial pointing at Melbourne.

Locals were allowed to climb the first mast just before the station opened in 1936.

The adjacent house was for the maintenance engineer & had already been sold by Telecom Broadcasting.

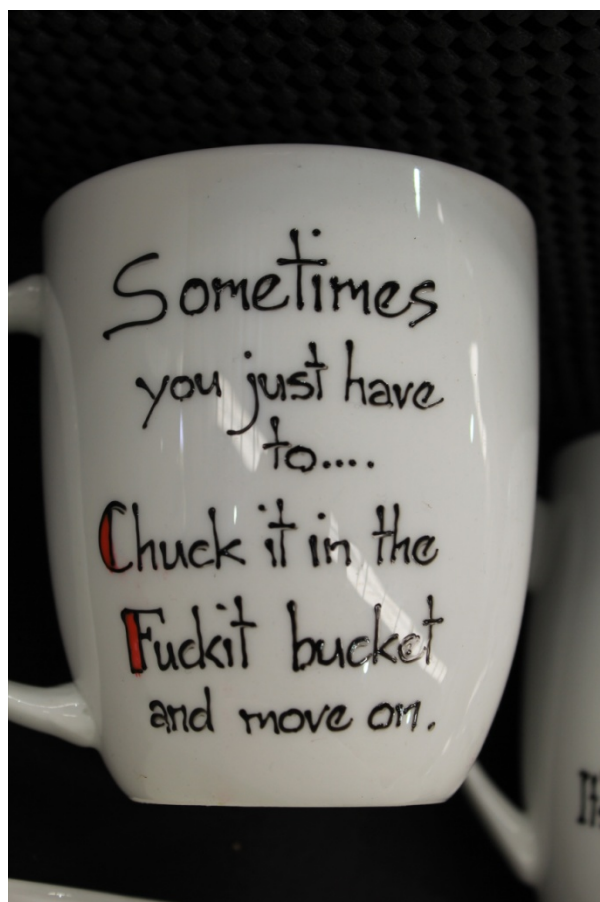
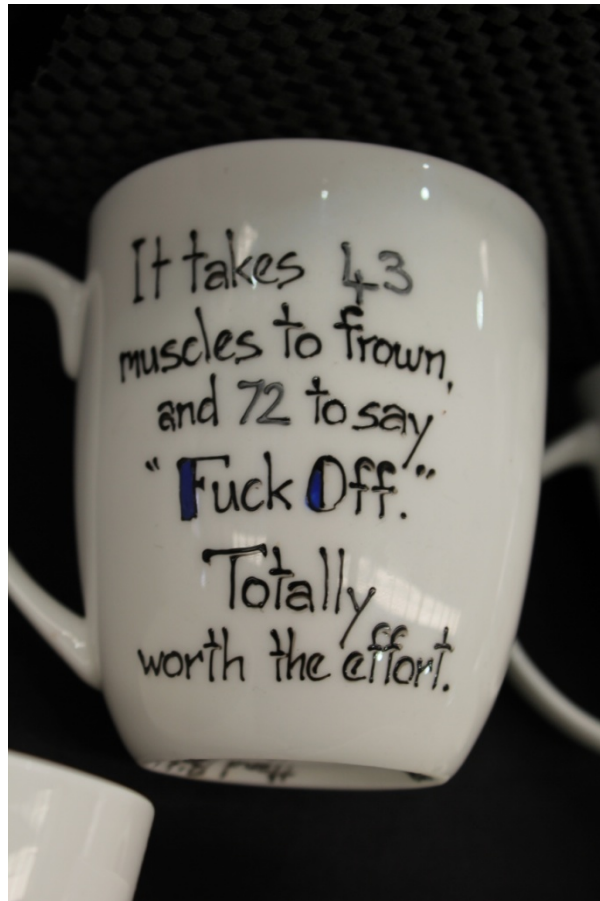
It would've made a nice weekender for a local 630m enthusiast for trans-Pacific CW skeds.







Your too late, it sold in 2018. ~Internet



Ballarat Amateur Radio Group Hamvention 2023

Sunday 5th of February

Traders from 8am
Doors open at 10am

The Ballarat Polo Club Pavilion
Ballarat Airport
Access off Airport Rd
207 Airport Rd, Mitchell Park VIC 3355

For Information, Table Bookings or Enquiries, contact Hamvention Coordinator:

hamvention2023@barg.org.au

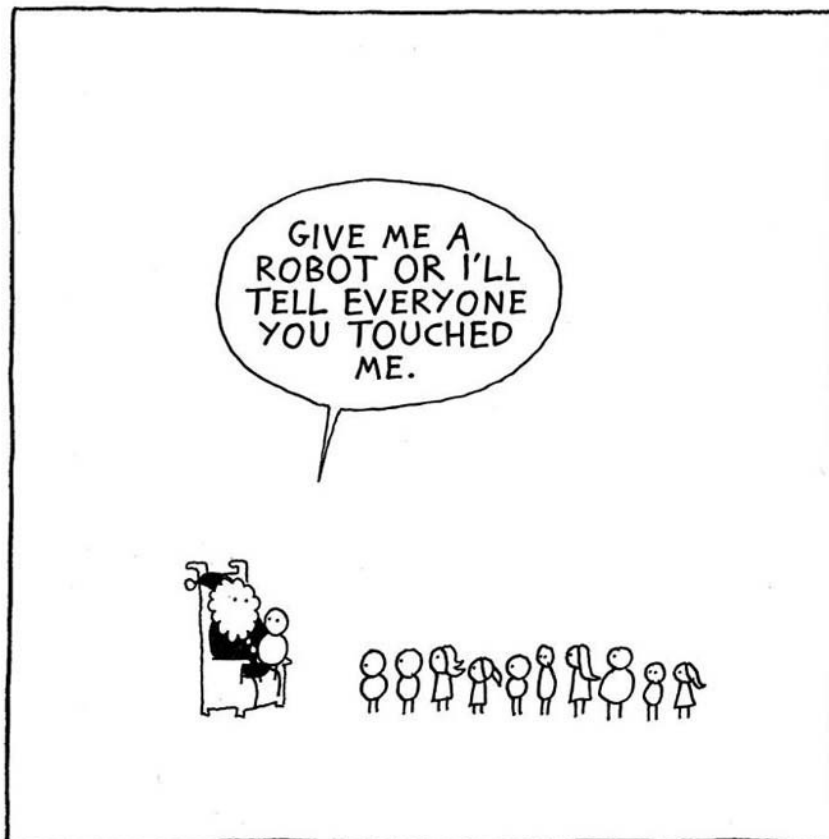
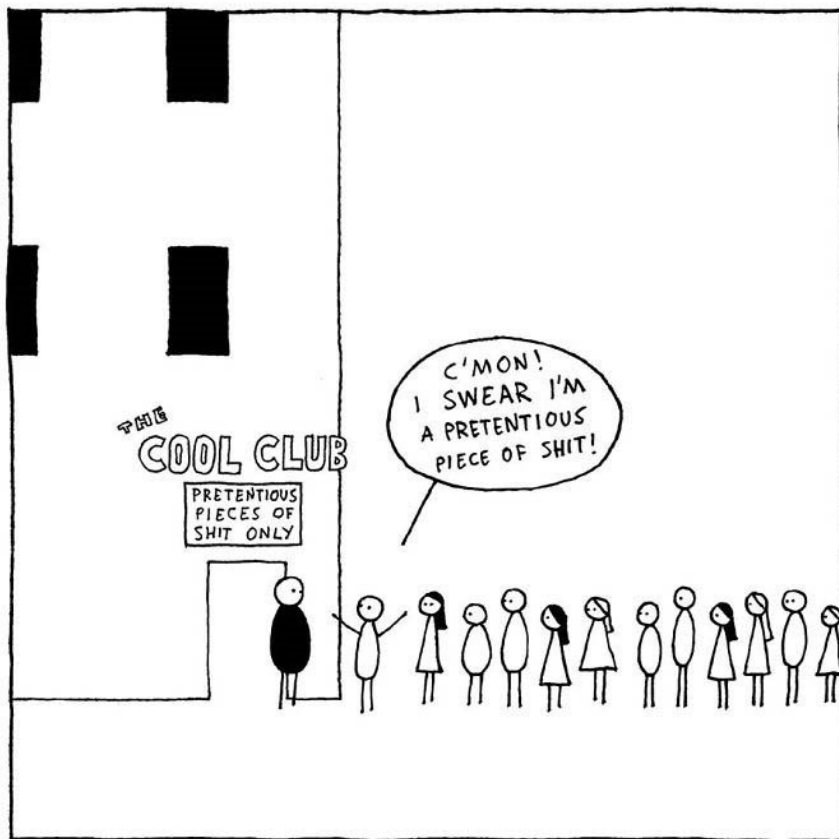
Entry is \$7.00 per person

Hiring a 1.8m space or table, inside or outside is \$20
Same cost whether you provide your own table or hire one.
This includes one entry.

SELLERS, save room in your vehicle for your sought after goods, book early and secure an onsite table for the same cost.

hamvention2023@barg.org.au

- * There will be trade displays from the usual traders.
- * The usual and popular pre-loved equipment displays and sales.
- * Food and drinks will be available on the premises.



Australia Ham Radio 40 Meter Net



7 Days a Week
10am Local time
(East coast)

7.100 MHz LSB

Approximately + or – QRM

Hosted by Ron VK3AHR

NEVARC 2 Meter Net

Net Control VK3ANE

NEVARC Linked Repeaters

VK2RWD, VK3RWO, VK3RWC

Wednesday - 8.00pm

Local time

President, VK3VS, Matt
Vice President, VK2VU, Gary
Secretary, VK2BFC, Frank
Treasurer, Amy Bilston



NEVARC CLUB PROFILE

History

The North East Victoria Amateur Radio Club (NEVARC) formed in 2014.

As of the 7th August 2014, Incorporated, Registered Incorporation number A0061589C.

NEVARC is an affiliated club of the Wireless Institute of Australia and The Radio Amateur Society of Australia Inc.

Meetings

Meetings details are on the club website, the Second Sunday of every month, check for latest scheduled details.

Meetings held at the Belvoir Guides Hall, 6 Silva Drive West Wodonga.

Meetings commence with a BBQ (with a donation tin for meat) at 12pm with meeting afterwards.

Members are encouraged to turn up a little earlier for clubroom maintenance.

Call in Via VK3RWO, 146.975, 123 Hz tone.

NEVARC NETS

HF

7.100 MHz 7 Days a Week - 10am Local time

VHF

VK2RWD Wednesday - 8.00pm Local time

NEVARC Linked Repeaters: VK2RWD, VK3RWO, VK3RWC

Benefits

To provide the opportunity for Amateur Radio Operators and Short Wave Listeners to enhance their hobby through interaction with other Amateur Radio Operators and Short Wave Listeners. Free technology and related presentations, sponsored construction activities, discounted (and sometimes free) equipment, network of likeminded radio and electronics enthusiasts. Excellent club facilities and environment, ample car parking.

Website: www.nevarc.org.au

Postal:

NEVARC Secretary
PO Box 8006
Birallee Park
Wodonga Vic 3690

Facebook: www.facebook.com/nevicARC/



All editors' comments and other opinions in submitted articles may not always represent the opinions of the committee or the members of NEVARC, but published in spirit, to promote interest and active discussion on club activities and the promotion of Amateur Radio.

Contributions to NEVARC News are always welcome from members.

Email attachments of Word™, Plain Text, Excel™, PDF™ and JPG are all acceptable.

You can post material to the Post Office Box address at the top of this page, or email magazine@nevarc.org.au

Please include a stamped self-addressed envelope if you require your submission notes returned.

Email attachments not to exceed 5 Mb in file size. If you have more than 5 Mb, then send it split, in several emails to us.

Attachments of (or thought to be) executable code or virulently affected emails will not be opened.

Other persons or radio clubs may edit or copy out such as they like from the magazine but a reference to NEVARC News is appreciated, except copyrighted (©) material or as otherwise indicated.

Other articles credited to outside sources should ask for their permission if they are used.

While we strive to be accurate, no responsibility taken for errors, omissions, or other perceived deficiencies, in respect of information contained in technical or other articles.

Any dates, times and locations given for upcoming events please check with a reliable source closer to the event.

This is particularly true for pre-planned outdoor activities affected by adverse weather etc.

The club website <http://nevarc.org.au> has current information on planned events and scheduled meeting dates.

You can get the WIA News sent to your inbox each week by simply clicking a link and entering your email address found at www.wia.org.au. The links for either text email or MP3 voice files are there as well as Podcasts and Twitter. This WIA service is FREE.